In the Claims:

1. (Currently Amended) A production line having a plurality of successive stages for construction of a product comprising ~~at least one~~a plurality of layer thicknesses on a substrate, and routers for transferring partly constructed products between the stages such that each stage receives a respective predefined partly constructed product as its input, the production line comprising:

~~a~~ predetermined ~~reflected light intensity spectrum~~layers properties data for at least one stage representing the respective predefined part construction for the stage,

a reflected light intensity spectrum deriver located at said at least one stage operable to obtain reflected light intensity spectra of incoming partly constructed product, said intensity spectrum deriver comprising:

an illuminator for irradiating a part product at least one point thereof with a multiple wavelength radiation source,

an intensity detector for detecting intensities within reflections of said source from said point,

an analyzer operatively associated with said intensity detector for analyzing said intensities in terms of wavelength, ~~and~~ converting said analyzed intensities spectrum into a frequency spectrum thereof and carrying out orthogonal processing of said frequency spectrum, said analyzer comprising:

a spectral analyzer connected to an output of said intensity illuminator for providing a spectral analysis of said intensities and

an orthogonal transform calculator connected to an output of said spectral analyzer for ~~producing said frequency spectrum by~~carrying out an orthogonal transformation of said spectrally analyzed ~~intensity~~ intensities~~spectrum~~, thereby to reveal thickness information of individual layers, ~~and~~

a layer property determiner for determining, from said orthogonal transformation of said frequency spectrum, layer properties of layers on said part product, and

a comparator, for comparing said obtained orthogonal transformation of said frequency spectrum or layer property data derived therefrom~~reflected light intensity spectra~~ with ~~said predetermined reflected light intensity spectrum~~expected ~~data~~layer properties, to determine whether layers of said incoming partly constructed products correspond with layers defined in said respective predefined part construction for the stage.

2. (Original) A production line according to claim 1, further comprising a routing error indicator operatively associated with said comparator for indicating a routing error when said layers do not match.

3. (Original) A production line according to claim 2, comprising a production interruption mechanism operatively associated with said routing error indicator for interruption of operation of said production line in the event of indication of a routing error.

4. (Original) A production line according to claim 1, wherein each stage comprises a plurality of production tools operating in parallel.

5. (Original) A production line according to claim 4, wherein each stage comprises a reflected light intensity spectrum deriver and a layer property determiner and has a predetermined intensity spectrum and predetermined layer properties.

6. (Original) A production line according to claim 5, wherein said comparator is further operable to compare said obtained layer properties with layer properties of at least one other stage to reroute said product to said other stage if layers indicated in said spectra match.

7. (Original) A production line according to claim 5, wherein said production line is a semiconductor wafer production line for producing a layered semiconductor wafer product.

8. (Canceled)

9. (Original) A production line according to claim 1, wherein said property is one of a group comprising a thickness and a refractive index.

10. (Original) A production line according to claim 1, wherein said part product includes at least one at least partly transparent layer and said reflections include reflections from an upper and a lower surface of said at least partly transparent layer.

11. (Original) A production line according to claim 1, wherein said orthogonal transform calculator comprises a Fourier transform calculator for producing said frequency spectrum by Fourier transformation of said analyzed intensity spectrum.

12. (Currently Amended) A tool guard for restricting input to a production tool for carrying out a stage in the production of a layered product having a plurality of layer thickness values, the tool guard comprising:

~~a~~ predetermined ~~intensity spectrum~~layers properties data representing an expected part construction for the stage,

an intensity ~~spectrum~~ deriver located at said tool operable to obtain an intensity spectrum of an incoming partly constructed product, said intensity spectrum deriver comprising:

an illuminator for irradiating a part product at at least one point thereof with a multiple wavelength radiation source, and

an intensity detector for detecting intensities within reflections of said source from said point,

an analyzer operatively associated with said ~~intensity detector~~intensity deriver for analyzing said intensities in terms of wavelength and converting said analyzed intensities spectrum into a transformation of a frequency spectrum thereof, said analyzer comprising:

a spectral analyzer for carrying out a spectral analysis of said detected intensities to produce an intensity spectrum, and

an orthogonal transform calculator, associated with said spectral analyzer, for ~~producing said frequency spectrum by~~carrying out said orthogonal transformation of said analyzed intensity spectrum, ~~thereby to reveal thickness information of individual layers, and~~

a layer property determiner, associated with said analyzer, for determining, from said orthogonal transformation of said frequency spectrum, layer properties of layers on said part product, and

a comparator, for comparing ~~said obtained intensity spectrum~~layer property determiner output with said predetermined ~~intensity spectrum,~~layers properties data to determine whether layer properties of said incoming partly constructed product corresponds with layer properties of said respective predefined part construction for the stage.

13. (Original) A tool guard according to claim 12, further comprising a routing error indicator operatively associated with said comparator for indicating a routing error when said layer properties do not match.

14. (Original) A tool guard according to claim 13, comprising a production interruption mechanism operatively associated with said routing error indicator for interruption of operation of said tool in the event of indication of a routing error.

15. (Original) A tool guard according to claim 12, wherein said tool is a semiconductor wafer production tool for use in a production line producing a layered semiconductor wafer product.

16. (Canceled)

17. (Original) A tool guard according to claim 12, wherein said property is one of a group comprising a thickness and a refractive index.

18. (Original) A tool guard according to claim 12, wherein said part product includes at least one at least partly transparent layer and said reflections include reflections from an upper and a lower surface of said at least partly transparent layer.

19. (Original) A tool guard according to claim 12, wherein said orthogonal transform calculator comprises a Fourier transform calculator for producing said frequency spectrum by Fourier transform of said analyzed intensities.

20. (Currently Amended) A production line router for routing intermediate inputs around a multiple stage production line, the intermediate inputs comprising substrates with at least one superimposed layer, the router comprising:

predetermined ~~intensity spectra~~layers properties data for each of a plurality of said stages representing a respective intermediate construction for the stage,

at least one intensity ~~spectrum~~ deriver located within said production line for obtaining intensity spectra of intermediate inputs, said intensity spectrum deriver comprising:

an illuminator for irradiating a part product at at least one point thereof with a multiple wavelength radiation source,

an intensity detector for detecting intensities within reflections of said source from said point,

an analyzer operatively associated with said intensity detector for analyzing said intensities in terms of wavelength and converting said analyzed intensities spectrum into a frequency spectrum thereof, said analyzer comprising:

a spectrum analyzer, associated with said intensity detector for obtaining a spectral analysis of said intensities, and

an orthogonal transform calculator, associated with said spectrum analyzer, for ~~producing said frequency spectrum by~~applying an orthogonal transformation ~~of said analyzed~~to said intensity spectrum, ~~thereby to reveal thickness information of individual layers, and~~

a layer property determiner, associated with said orthogonal transform calculator, for determining, from said orthogonal transformation of said frequency spectrum, layer properties of layers on said part product, and

a comparator, for obtaining a closest match between layers defined in said obtained intensity spectrum and layers defined in any of said predetermined ~~spectra~~layers properties data, said router being operable to route said intermediate input to a stage corresponding to said closest matching spectrum.

21. (Original) A production line router according to claim 20, wherein each stage comprises a plurality of production tools operating in parallel.

22. (Original) A production line router according to claim 21, wherein each stage comprises an intensity spectrum deriver and a layer property determiner and has a predetermined intensity spectrum and predetermined layer properties.

23. (Original) A production line router according to claim 20, wherein said production line is a semiconductor wafer production line for producing a layered semiconductor wafer product.

24. (Canceled)

25. (Original) A production line router according to claim 20, wherein said property is one of a group comprising a thickness and a refractive index.

26. (Original) A production line router according to claim 20, wherein said intermediate input includes at least one at least partly transparent layer and said reflections include reflections from an upper and a lower surface of said at least partly transparent layer.

27. (Original) A production line according to claim 20, wherein said orthogonal transform calculator comprises a Fourier transform calculator for producing said spectrum by Fourier transform of said analyzed intensities.

28. (Currently Amended) A wafer production history determiner for determining the production history of a semiconductor wafer product having multiple thicknesses, the determiner comprising:

a plurality of predetermined ~~intensity spectra~~layers properties data for semiconductor wafer products having completed respective stages of a multiple stage semiconductor wafer production process.

an intensity ~~spectrum~~ deriver for obtaining an intensity spectrum of an incoming semiconductor wafer product said intensity spectrum deriver comprising:

an illuminator for irradiating a part product at at least one point thereof with a multiple wavelength radiation source, and

an intensity detector for detecting intensities within reflections of said source from said point,

an analyzer operatively associated with said intensity detector for analyzing said intensities in terms of wavelength and converting said analyzed intensities spectrum into a transformation of a frequency spectrum thereof, said analyzer comprising:

a spectrum analyzer associated with said intensity detector for performing a spectral analysis of said intensities, and

an orthogonal transform calculator, associated with said spectrum analyzer, for ~~producing said frequency spectrum by~~carrying out orthogonal transformation of said analyzed intensity spectrum, ~~thereby to reveal thickness information of individual layers, and~~

a layer property determiner for determining, from said orthogonal transformation of said frequency spectrum, layer properties of layers on said part product,, and

a comparator, for comparing layers defined in said obtained ~~intensity spectrum~~layers properties with layers defined in each of said predetermined ~~intensity spectra~~layers properties data , to determine a closest match between said obtained ~~spectrum~~ layers properties and one of said predetermined ~~spectra~~layers properties data, said determiner inferring said production history as including the respective completed stage corresponding to said closest match predetermined ~~spectrum~~layers properties data.

29. (Currently Amended) ~~The use~~A method of production history analysis for a layered product having multiple layer thicknesses and at least one discontinuous layer, comprising: ~~of~~

applying orthogonal transform processing ~~on~~ to an intensity spectrum obtained by reflecting multiple wavelength light from a plurality of points on said ~~a~~ layered product, ~~to~~

using a result of said orthogonal transform processing to determine layer thicknesses including a thickness of said discontinuous layer within said product, ~~thereby to~~ and

using said layer thicknesses to determine a production history of said layered product.

30. (Currently Amended) In a production line having a plurality of successive stages for construction of a product comprising ~~at least one at least semi-transparent layer~~a plurality of layer thickness values on a substrate, and routers for transferring a partly constructed product between the stages such that each stage receives a respective predefined partly constructed product as its input, and having a predetermined intensity spectrum associated with at least one stage representing the respective part construction for the stage, a method comprising:

obtaining intensity spectra of partly constructed products incoming to said stage, said obtaining comprising

irradiating a part product at least one point thereof with a multiple wavelength radiation source,

detecting intensities within reflections of said source from said point,

analyzing said intensities in terms of wavelength, thereby to produce a spectrum of intensities at respective wavelengths,

~~converting~~ transforming said spectrum of intensities into a frequency spectrum using orthogonal transformation of ~~analyzed intensities~~said spectrum of intensities, ~~and~~

determining, from said orthogonal analysis of said frequency spectrum, layer properties of layers on said part product, and

comparing said layer properties with layer properties of said predetermined intensity spectrum, and thereby determining whether said incoming partly constructed product corresponds with said respective predefined part construction for the respective stage.

31. (Original) A method according to claim 30, further comprising indicating a routing error when said layer properties do not match.

32. (Original) A method according to claim 31, comprising interrupting operation of said production line in the event of indication of a routing error.

33. (Original) A method according to claim 30, wherein each stage comprises a plurality of production tools operating in parallel.

34. (Original) A method according to claim 33, comprising obtaining intensity spectra for incoming partly constructed products to each stage, each said stage having a predetermined intensity spectrum defining layer properties.

35. (Original) A method according to claim 34, comprising comparing said obtained layer properties with predetermined layer properties of at least one other stage to reroute said product to said other stage if respective layer properties match.

36. (Original) A method according to claim 30, wherein said production line is a semiconductor wafer production line for producing a layered semiconductor wafer product.

37. (Canceled)

38. (Original) A method according to claim 30, wherein said property is one of a group comprising a thickness and a refractive index.

39. (Original) A method according to claim 30, wherein said part product includes at least one at least partly transparent layer and said reflections include reflections from an upper and a lower surface of said at least partly transparent layer.

40. (Original) A production line according to claim 30, wherein said orthogonal analysis comprises Fourier analysis.